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10/542,638	01/13/2006	Anton Seelig	20800/020-4884-US0	1734
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EXAMINER KAPLAN, HAL IRA				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/542,638

**Applicant(s)**

SEELIG ET AL.

**Examiner**

Hal I. Kaplan

**Art Unit**

2836

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 November 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 17-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-22 and 24-29 is/are rejected.
- 7) ☒ Claim(s) 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
- Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Drawings*

1. The drawings were received on January 13, 2006. These drawings are accepted.

### *Claim Objections*

2. Claim 29 is objected to because of the following informalities: Claim 29, line 7, "these half-waves;" should be "these half-waves; and". Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 17 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the US patent of Phelps, III et al. (7,198,223) in view of the US patent of Doemens et al. (6,084) and the US patent of Jang et al. (6,934,167).

As to claim 17, Phelps discloses a rotary-wing aircraft system (10) including a rotor shaft (106), and an actuator control element (electrical control for actuator 120 or 122), wherein the actuator control element is disposed in an area of the rotor shaft and a rotor head of the rotary-wing aircraft (see column 9, lines 38-44; column 10, lines 4-13; and Figures 6-8). Phelps does not disclose the claimed inductive transformer, frequency generator, or power semiconductors.

Doemens discloses an inductive transformer including a primary winding (SS) disposed on the stationary portion of a rotor shaft bearing and a secondary winding (RS) disposed on the rotor shaft, the inductive transformer bridging an isolating point between the stationary portion of the rotor shaft bearing and the rotor shaft; and a frequency generator (HFG) connected to the primary winding (SS) (see column 3, line 58 - column 4, line 15 and Figure 1). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to have used the rotor shaft bearing and rotor shaft of Doemens in the aircraft of Phelps, in order to enable the pilot to precisely

monitor the angular speed of the rotor to ensure safety (see column 1, lines 65-67).

Doemens does not disclose the claimed series-resonant circuit capacitor or switchable power semiconductors.

Jang discloses a non-contact electric power transmission system comprising a series-resonant circuit capacitor connected to the primary winding (Cp) of an inductive transformer (TR) and including a matrix arrangement of a plurality of switchable power semiconductors (S<sub>1</sub>,S<sub>2</sub>,D<sub>1</sub>,D<sub>2</sub>) connected to the secondary winding (Cs). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to have modified Phelps in view of Doemens using the teachings of Jang, in order to provide a simple non-contact electric power transmission system with a highly regulated power transfer, while avoiding harmful switching conditions (see Jang, column 2, lines 31-34). As to claims 20-21, Jang discloses switchable power semiconductors (S<sub>1</sub>,S<sub>2</sub>,D<sub>1</sub>,D<sub>2</sub>) configured to form an output voltage and disposed in a direction relative to only one polarity of the output conductor, but Jang does not specifically disclose the use of unipolar or bipolar semiconductors. However, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to have selected unipolar or bipolar semiconductors, because the selection of polarity values for an electronic device is an engineering decision based upon the system's intended use and the expected requirements of the other systems with which it will interface. See MPEP

§2144.04(IV)(A). In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation

of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

7. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Phelps in view of Doemens and Jang as applied to claim 17 above, and further in view of the US patent of Jaenker (6,231,013).

As to claims 18-19, Phelps in view of Doemens and Jang disclose all of the claimed features, as set forth above, except the cited references do not specify which type of actuator is used. Jaenker discloses capacitive actuators (31,34) used in a rotary-wing aircraft, wherein at least one of the capacitive actuators is disposed in a rotor blade of the rotary-wing aircraft (see column 5, lines 43-50). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to have used one or more capacitive actuators in the system of Phelps in view of Doemens and Jang, because capacitive actuator systems of compact, light, and efficient (see Jaenker, column 3, lines 26-30).

8. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Phelps in view of Doemens and Jang as applied to claim 17 above, and further in view of the US patent of Naitoh et al. (6,232,775).

As to claim 25, Phelps in view of Doemens and Jang disclose all of the claimed features, as set forth above, except for the claimed azimuth sensor. Naitoh discloses an azimuth sensor (10) (see column 12, lines 55-60 and Figure 1). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to have used an

azimuth sensor in the system of Phelps in view of Doemens and Jang, in order to provide a compact sensor for monitoring the position of the rotor blade.

9. Claims 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Phelps in view of Doemens and Jang as applied to claim 17 above, and further in view of the US patent of Hirai et al. (5,798,622).

As to claims 26-27, Phelps in view of Doemens and Jang disclose all of the claimed features, as set forth above, except for the claimed sensor and electrical controls. Hirai discloses the use of actuators (364<sub>6</sub>, 364<sub>7</sub>) in rotor blades or helicopters, wherein the actuators are not disposed in the rotor shaft of the static side (see Figure 35). The helicopters of Hirai are aerodynamically active devices. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to have modified Phelps in view of Doemens and Jang by disposing the azimuth sensor in an area of the rotor blade and disposing electrical controls and the actuator control element in the rotor head, in order to provide a more efficient design.

10. Claims 22 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Phelps, Doemens, Dang, and Jaenker, and further in view of the Japanese patent of Kurakawa et al. (07-046864).

As to claim 22, Phelps, Doemens, Dang, and Jaenker disclose all of the claimed features, as set forth above, except for the claimed actuator control element. Kurakawa discloses a driver for a piezoelectric actuator which detects the polarity of an error signal through half-wave signals. The charging/discharging currents of the actuator are detected to provide output to the amplifiers and control the position of the piezoelectric

actuator (see Abstract). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to have modified the system of Phelps, Doemens, Dang, and Jaenker with the teachings of Kurakawa, in order to provide electrical isolation in an efficient and inexpensive manner.

As to claims 28-29, Phelps, Doemens, Dang, and Jaenker disclose a method of providing power to at least one actuator. Jaenker discloses piezoelectric actuators wherein at least one actuator is arranged on a moving part that is separated from a stationary part by an isolating point (see Hirai, Figure 35). The method comprises: generating a high-frequency AC current from a DC voltage using a frequency generator (361<sub>2</sub>) disposed in the stationary part, the high-frequency AC current having an amplitude not dependent on any phase angle or amplitude of a reverse voltage (see Hirai, Figure 35); transmitting the alternating current from a primary winding of an inductive transformer (362) that bridges the isolating point (see Hirai, Figure 35) separating the AC current coming from a secondary winding of the inductive transformer (362) in the moving part into positive and negative half-waves or segments of positive and negative half-waves (see Jang, Figure 4, elements S<sub>1</sub>, S<sub>2</sub>, D<sub>1</sub>, D<sub>2</sub>), and impressing the AC current into the at least one actuator using an electronic control element in a direction such that a length change of the actuator occurs in a desired direction in each half-wave (see Kurakawa, Abstract).



***Allowable Subject Matter***

11. Claim 23 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter:

Claim 23 contains allowable subject matter because, as noted in the Office action dated February 8, 2008, none of the prior art of record discloses or suggests the claimed actuator control element and controller, in combination with the remaining claimed features.

***Response to Arguments***

13. Applicant's arguments, see Remarks, filed November 6, 2008, with respect to the objections to the specification, drawings, and claims 20-23, 26, and 28 have been fully considered and are persuasive. The objections have been withdrawn.

14. Applicant's arguments, see Remarks, filed November 6, 2008, with respect to the rejection(s) of claim(s) 17-29 under 35 U.S.C. 112, second paragraph, and 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Phelps, Doemens, and Naitoh.

***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The US patents of Seelig (6,005,304 and 6,462,432) and Stone

(6,032,546) teach contactless power transmission via an inductive transformer, and the US patents of Lafortune et al. (3,617,017), Zoppitelli et al. (6,712,313), and Pica (6,845,941) teach rotary-wing aircraft with rotors and actuators.

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hal I. Kaplan whose telephone number is 571-272-8587. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on 571-272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hik  
/Albert W Paladini/  
Primary Examiner, Art Unit 2836

1/8/09